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22 October 1959

MEMORANDUM FOR: THE RECORD

SUBJECT : TRIP REPORT

1. TIME AND PLACE OF MEETING: [REDACTED] New York,  
21 October 1959.

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2. ATTENDANCE: [REDACTED]

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3. DISCUSSION:

a. [REDACTED] accompanied the undersigned on this trip in order to familiarize himself with contractors working on projects for TSS/APD.

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b. The transistorized wire analyzer project was the main topic of discussion during this visit. Four transistorized units are being developed and constructed under this program. Two of these units have been delivered. The third unit was demonstrated to the undersigned. Improvements incorporated in this unit include the following:

- (1) Increase in DC output voltage from 250 volts to 500 volts.
- (2) Increase in filtering and shielding to reduce hum for DC/AUDIO function.
- (3) Improved mechanical rigidity and overall layout of sub-assemblies to allow production and improve mechanical strength.

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c. The improvement of (2) above has resulted in an overall hum reduction of approximately 35 db from the former two units.

d. The output of the DC power supply is capable of supplying up to 500 volts DC to any load resistance between 3000 ohms and 100 K. Below 3000 ohms a maximum deflection of 50 ma on the milliammeter will occur prior to a maximum 500 V output. For a load of 100 K ohm, a load current of 5 ma may easily be read on the milliammeter.

e. Discussions were held concerning the tests to be performed on this unit prior to acceptance. These tests will verify the following characteristics:

- (1) Oscillator frequency, stability, distortion and accuracy.
- (2) Oscillator output, in terms of volts (RMS) across a 1000 ohm load.
- (3) Minimum coupling from oscillator to voltmeter.
- (4) Voltmeter range, stability, accuracy, sensitivity and frequency response.
- (5) Audio amplifier gain, frequency response, output.
- (6) Audio transmitter output in terms of RMS volts across 2000 ohms, including maximum distortion.
- (7) AC and DC power supply output voltage, frequency, ripple and regulation.
- (8) Overall current requirements and battery charging circuit performance.

f. The third unit will be ready for final acceptance tests by the undersigned by 1 November 1959. It is expected that the fourth and final unit will be available by 20 November 1959.

g. In all probability the fourth unit will remain at the Contractor's facility to be used as a standard for the production of fifteen (15) additional units. The contract for this production is presently being processed and had not been received by the Contractor at the time of the undersigned's visit.

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h. Additional discussions were held concerning the proposal for a production of eighty-five (85) units for the Office of Security. A draft of this proposal is to be sent to the undersigned prior to 1 November 1959. (A request for a formal proposal for the production of 85 units was made by [ ] at a meeting with the undersigned on 20 October 1959.)

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1. A model 30, <sup>tube version</sup> ~~vacuum~~ wire analyzer was returned to the Contractor to demonstrate an undesirable characteristic of the unit when making an AC voltage check on power lines. The undesirable characteristic was an apparent short circuit of the "line" AC to ground when the GROUND terminal was used. A demonstration of this occurrence was made by the undersigned. Circuit investigation revealed that the "hot" side of the AC was separated from ground by a small coupling capacitor only when the GROUND terminal was used. When the normal input pair of test terminals were used all was normal.

It was decided that the GROUND terminal on the model 30 analyzers should not be used when making AC voltage measurements on power lines. (The Office of Security has been so advised as of 22 October 1959.)

The chassis of the model 30 analyzer is common, but not grounded. The reason for this is the circuit design of the oscillator. The oscillator operates above a -60 volt potential instead of ground. Since the voltmeter is common with the oscillator for several functions, the voltmeter common is isolated from actual ground by capacitor.

The addition of a GROUND terminal, which could be connected to an earth ground, was intended to aid in the reduction of hum on the DC/AUDIO function. Tests were conducted to determine this effect and the results showed no appreciable hum reduction. Thus, the GROUND terminal serves no useful purpose.

Since the unit performs satisfactorily with the test terminals provided, it has been decided to remove (or not use) the GROUND terminal from all model 30 wire analyzers.

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j. Another phenomenon, characteristic of the model 30 analyzers, due to the reactive coupling to ground, is as follows:

If an AC voltage test is being made on an AC power line, the attachment of one test lead to the AC line may result in a 110 reading of the voltmeter. This is due to reactive coupling from the test lead to one side of the AC power plug of the unit. No current is involved if this operation is performed, hence there is no hazard to the operator. When both test leads are connected and the test button is depressed, the unit performs normally and satisfactorily. These test procedures are clearly defined in the instruction manual.

k. The Office of Security is aware of the above characteristic.



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Distribution:



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